C. G. CABANNE.

GAS ENGINE.

APPLICATION FILED NOV. 26, 1915.

1,232,215.

Patented July 3, 1917.

2 SHEETS—SHEET 1.

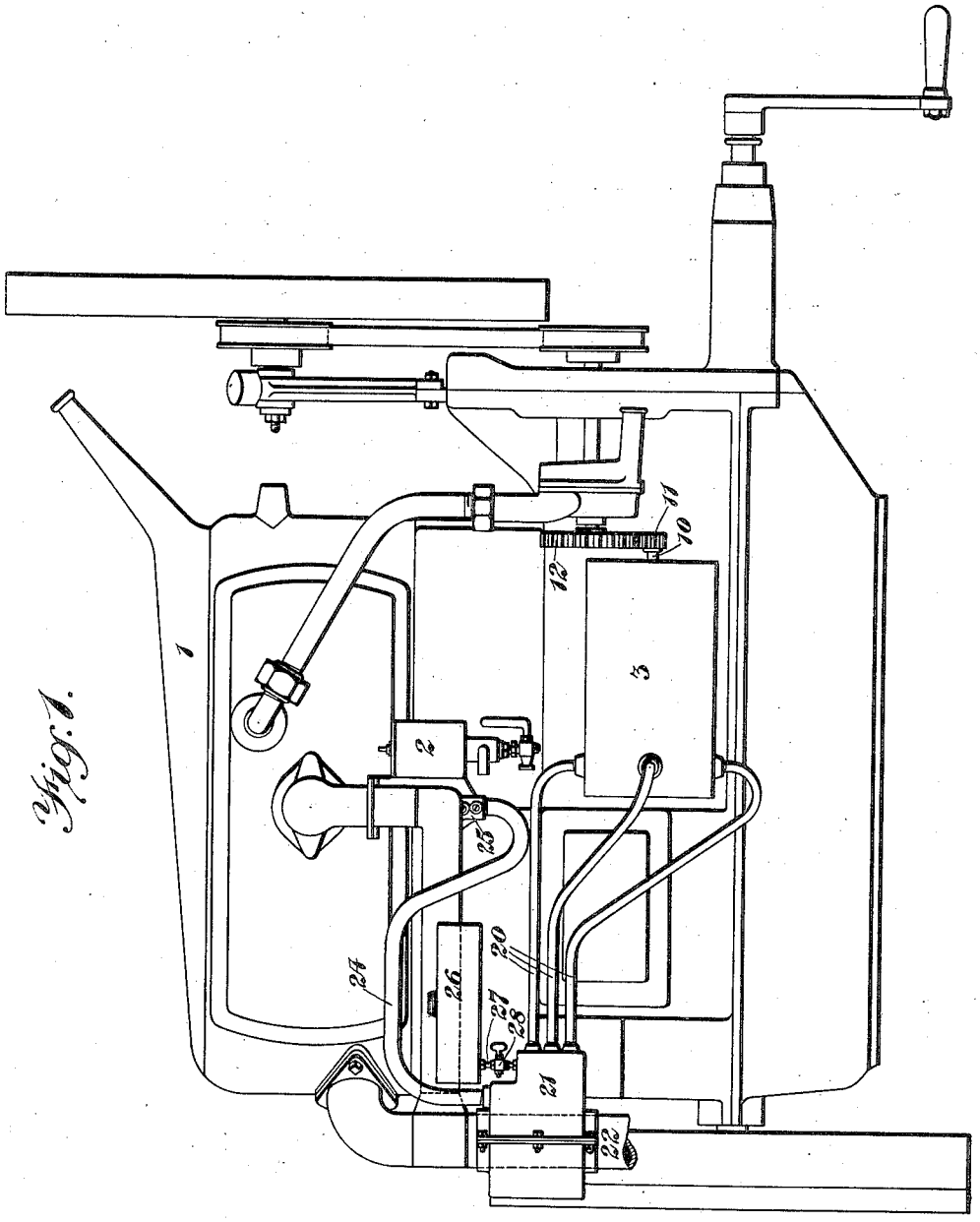


Fig. 1.

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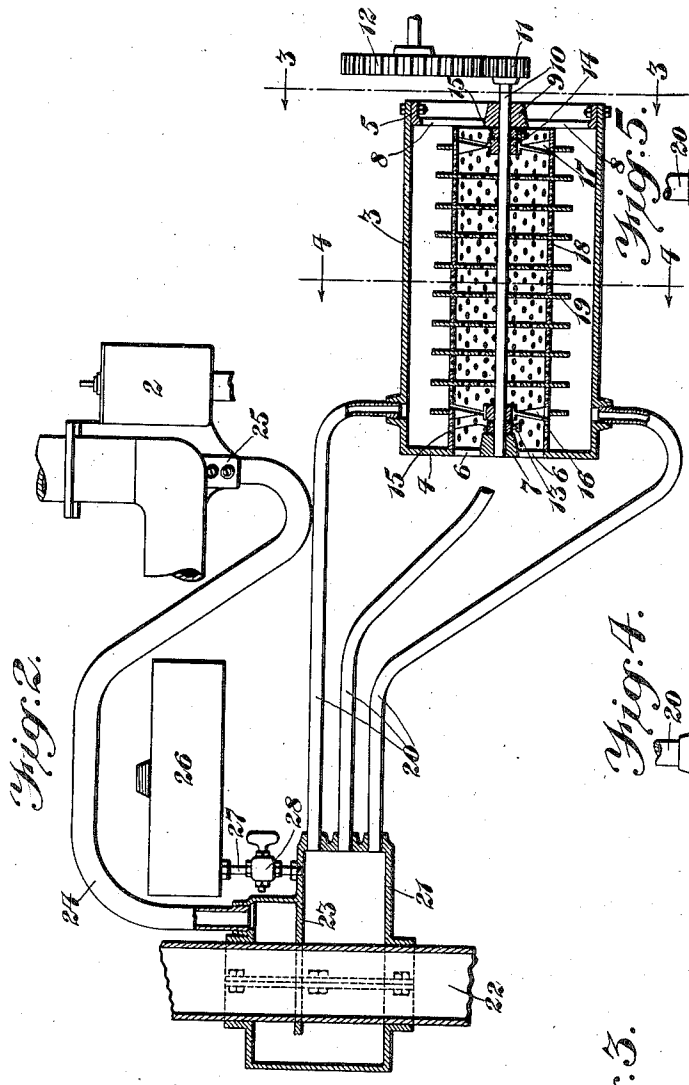


Fig. 2.

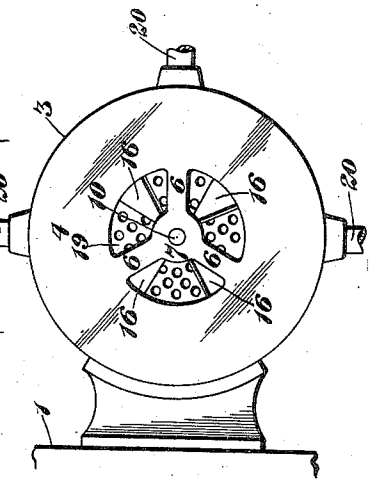


Fig. 5.

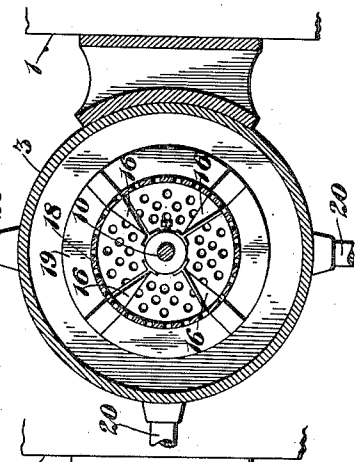


Fig. 4.

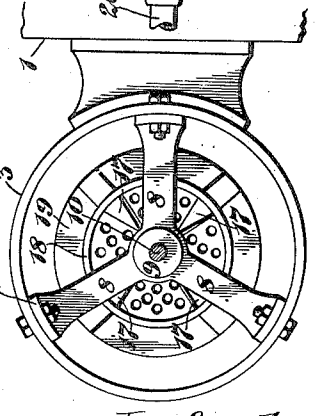


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES G. CABANNE, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-FOURTH TO THOMAS LONERGAN, OF ST. LOUIS, MISSOURI.

GAS-ENGINE.

1,232,215. Specification of Letters Patent. Patented July 3, 1917.

Application filed November 26, 1915. Serial No. 63,614.

To all whom it may concern:

Be it known that I, CHARLES G. CABANNE, a citizen of the United States, residing at the city of St. Louis and State of Missouri, have invented a new and useful Gas-Engine, of which the following is a specification.

This invention relates to improvements in gas engines, and consists in the novel design, arrangement and combination of parts hereinafter more fully described.

An object of the invention is to provide in combination with an internal combustion engine, a mixing device or carbureter and a fuel supply passage therefor of a mechanically operated device for separating oxygen from the air with connections between the separating device and the mixing device, whereby the separated volume rich in oxygen is introduced into the mixing device effectively to produce a highly explosive mixture and formed from the volatile products from the fuel introduced into the mixing device and the volume of gas rich in oxygen.

Another object of the invention is to provide in combination with an internal combustion engine, a mixing device and a fuel supply passage therefor of a separating device driven by the engine with connections for conducting from the separating device to the mixing device the volume of gas, rich in oxygen, with means in said connection whereby the volume of gas passing from the mixing device may be heated, together with provision for introducing into the conduit measured quantities of water or other liquid whereby the supply from said conduit entering the mixing device is of a character adapted to mix with the volatile products from the fuel introduced into the mixing device effectively to form a gas of high explosive power for the operation of the engine.

Another object of the invention is to provide a gas supply for an internal combustion engine, whereby a low grade of hydrocarbon oil may be utilized as the base fuel by providing a supply of gas, rich in oxygen, for mixing with the volatile products of the oil, thereby producing a highly explosive mixture.

With these general objects, as well as the production of suitable mechanism for attaining such objects, in view I have designed, combined and arranged the various elements and mechanisms in the manner and form hereinafter more fully disclosed, reference being made to the accompanying drawing, in which—

Figure 1 is a side elevation of an internal combustion engine with its associated parts having applied thereto the mechanism and construction embodying the invention.

Fig. 2 is a detailed view illustrating in vertical section the separating device, the heating chamber through which the separated volume of gas is required to pass, the water supply device and the connections with the engine carbureter.

Fig. 3 is an end elevation of the separating device taken substantially on the line 3—3 of Fig. 2.

Fig. 4 is a cross section through the separating device taken substantially on the line 4—4 of Fig. 2.

Fig. 5 is an end elevation of the separating device.

In the embodiment of the invention illustrated in the drawings, I have shown in a conventional manner an internal combustion engine 1 together with the usual associated mechanisms, including a carbureter 2. Adjacent to the engine case is located the separating device forming an element of the present invention which includes an outer casing 3 supported rigidly with respect to the engine casing in any suitable manner, and having at each end end-pieces 4 and 5 respectively. The form of the end-piece 4 is clearly illustrated in Fig. 5 and from which it will be seen that said piece is made in the form of a disk having cut out portions near the center thereof forming a spider having radial arms 6 supporting at their inner extremity a bearing portion 7. The opposite end-piece is in the form of a spider having radial arms 8 and supporting at the converging center thereof a bearing portion 9. A shaft 10 is supported rigidly within the bearings 7 and 9 and extends at one end beyond the casing 3 and having a pinion 11 affixed to said extending end.

For the purposes of practical illustration I have shown the pinion 11 driven from a gear 12 attached to an extension of the timer shaft of the engine. It will be understood, however, that the shaft 10 may be

driven by other suitable connections from any moving part of the engine. Upon the shaft 10 and disposed near each end of the casing 3 are hubs 13—14 respectively, there being between the hubs and the inner face of the bearing members 7 and 9 spacing collars 15.

Radiating from the hubs 13 and 14 respectively are blades or vanes 16 and 17 which are deflected so as to cause a passage of air through the separating device. A rotatable drum or casing 18 is supported at each end by the extremities of the blades 16 and 17, respectively. The drum 18 is perforated so as to admit a passage of gas therethrough and is designed to rotate as the shaft 10 is driven. Intermediate the blades 16 and 17 and supported upon the shaft 10 is a series of perforated disks 19 which extend slightly beyond the periphery of the drum or casing 18.

In operation air is drawn into the separating device through the end-piece 4 by the blades 17 operating as an exhauster and is subjected to the centrifugal force resulting from the rotation of the blades 16 and 17, the drum 18 and the disks 19; and, since the specific gravity of the oxygen contained in the air is more than that of the nitrogen, the oxygen will be driven to the outer zone between the casing 3 and the periphery of the drum 18, and the nitrogen will be drawn through the device and driven to atmosphere through the openings in the end-piece 4.

Leading from the exhausting end of the separating device are a series of conduits 20 which enter at their opposite ends a chamber 21. The chamber 21 is formed round the exhaust conduit 22 of the engine, and is provided preferably with a baffle wall 23 so that the volume of gas conducted from the separating device through the conduits 20 will be required to pass around the exhaust conduit to the upper part of the chamber 21, from which it is conducted by a conduit 24 to the intake 25 of the carbureter or mixing device of the engine. As the volume of gas enters the chamber 21, means are provided for introducing water or other fluid in small quantities, said means including a storage tank 26 having a supply conduit 27 leading therefrom to the chamber 21, said conduit being controlled by a valve 28.

It has been found in practice that by the injection of oxygen into the carbureter in lieu of the mixture of oxygen and nitrogen composing the air, the efficiency of the resulting explosive mixture of the oxygen with the volatile products of the hydrocarbon oils or other compounds, represents a substantial increase over the usual method of carburation. This efficiency is increased by heating the volume of gas, high in oxygen, prior to its introduction into the carbureter, and is further increased by the introduction of small quantities of moisture.

The apparatus disclosed presents the practical mechanism for accomplishing the separation of the component parts of the atmosphere and for utilizing the volume of resulting gas, high in oxygen, as a supply for the carbureter, including also satisfactory means for heating the volume of the supply and for introducing moisture thereinto.

I am aware that other satisfactory forms of air separating devices may be utilized, it being contemplated that an attachment can be designed, whereby the fan of the engine may be utilized for separating purposes. I do not desire to limit myself to any specific forms of connection, but what I claim broadly and desire to secure by Letters Patent, is:—

1. In an internal combustion engine, the combination with a plurality of engine cylinders, a carbureter having service passages leading to said cylinders, a fuel liquid inlet for said carbureter, a second passage entering said carbureter, and a mechanical device driven by the engine adapted to separate oxygen from the air and to introduce the separated oxygen into said last-named passage entering said carbureter under pressure, substantially as specified.

2. In an internal combustion engine, the combination with a plurality of cylinders, a single carbureter adapted to serve said cylinders and having a fuel liquid inlet and a gaseous inlet passage, an exhaust pipe, a chamber surrounding said exhaust pipe and adapted to be heated therefrom and having said gaseous inlet passage to said carbureter opening therein, a mechanical device operated by the engine and adapted to separate oxygen from the atmosphere and to operate as a blower for ejecting said oxygen, a plurality of passages from said device adapted to receive the oxygen under pressure and to deliver it to said chamber, substantially as specified.

3. In an internal combustion engine, the combination of a carbureter adapted to serve a plurality of piston cylinders and having a fuel liquid inlet and a gas inlet passage, a heating chamber surrounding the exhaust manifold of the engine and having a transverse baffle wall therein, a passage leading from said chamber to the gas intake of the carbureter, a plurality of inlet passages to said chamber on the opposite side of said baffle wall from the opening of said last-named passage, means for supplying measured quantities of fluid to said heating chamber, and a mechanical device operated by the engine adapted to separate oxygen from the air and to force it through said last-named passages to said heating chamber, substantially as specified.

4. In an internal combustion engine, a working cylinder, a carbureter adapted to serve said cylinder, a fuel liquid inlet passage to said carbureter, an air inlet passage to said carbureter, and a mechanical device adapted to create a pressure in said air passage whereby air is introduced into the carbureter under pressure.

In witness whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES G. CABANNE.

Witnesses:
L. C. KINGSLAND,
N. G. BUTLER.